Abstract: The goal of this paper is to compare two formulations of optimization problems of vertex coloring under uncertainty. These two formulations are integer linear programming with constraints and integer quadratic without constraints. First chapter introduces integer linear programming. In second chapter we learn about these two formulations. Third chapter deals with implementation of these two formulations in optimization program called GAMS. We randomly generate 20 optimization problems of vertex coloring under uncertainty and compare integer linear formulation with constraints and integer quadratic formulation without constraints.